

*FUNCTIONAL ASSESSMENT AND NONCONTINGENT
REINFORCEMENT IN THE TREATMENT OF
DISRUPTIVE VOCALIZATION IN ELDERLY DEMENTIA PATIENTS*

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Noncontingent reinforcement (NCR) was used as an intervention with 2 elderly dementia patients who engaged in disruptive vocalization. Several assessment procedures, including functional analysis, were conducted to identify reinforcing stimuli for use in the NCR intervention. Functional analyses and the NCR intervention were implemented in each participant's natural environment. NCR was effective in reducing disruptive vocalizations.

DESCRIPTORS: dementia, disruptive vocalizations, noncontingent reinforcement

Disruptive vocalization (e.g., screaming, repetitive requests), which is commonly exhibited by dementia patients residing in nursing homes, has a number of undesirable consequences (e.g., social isolation). In particular, this behavior is often considered to be an inevitable part of the disease process, leading to reliance on medical management that has serious drawbacks (e.g., side effects, including sedation and lethargy). Behavior-analytic approaches, which focus on identifying and manipulating the environmental variables that are functionally related to challenging behavior, provide a promising set of alternative interventions. The goals of this study were to investigate the utility of functional assessment in guiding treatment development with elderly dementia patients and to evaluate the effectiveness of noncontingent reinforcement (NCR), a procedure that involves presenting a stimulus with known reinforcing properties on a time-based schedule (Ringdahl, Vollmer, Borrero, & Connell, 2001; Vollmer, Iwata, Zarcone, Smith, & Mazaleski, 1993).

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METHOD

Participants and Settings

HJ was an 89-year-old woman who had been diagnosed with "dementia with agitation." TJ was an 82-year-old man who had been diagnosed with mixed Alzheimer's disease and vascular dementia. Both participants lived in a nursing home and had been referred for frequent disruptive vocalizations.

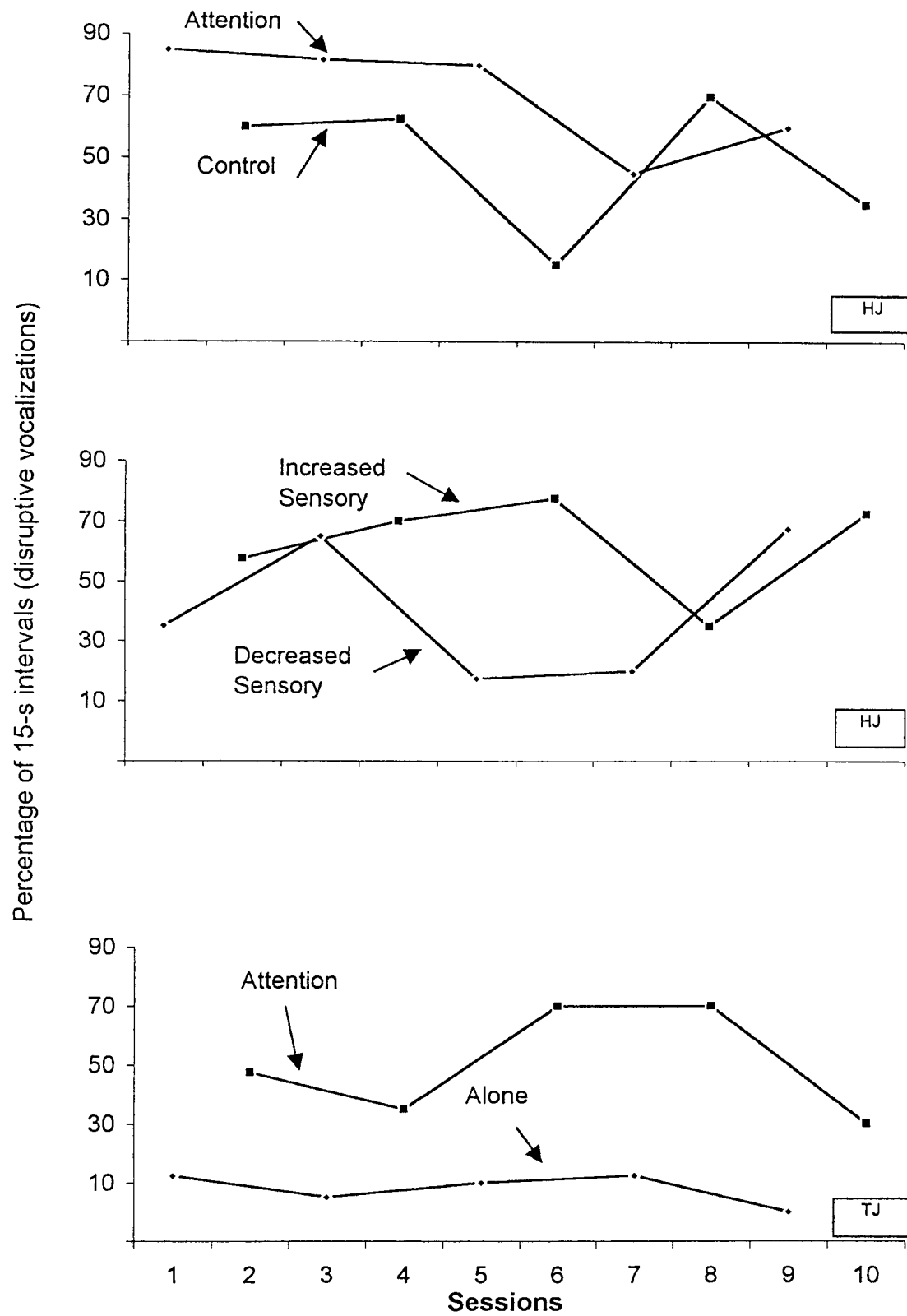
All sessions were conducted in the participant's natural environment at approximately the same time each day in the environment in which the target behavior tended to occur.

Response Measurement and Reliability

Disruptive vocalization was defined as any vocalization that could be heard from at least 7.6 m away, except for appropriate conversation. Two trained research assistants independently recorded the occurrence of disruptive vocalizations using a 15-s partial-interval recording system during the functional analysis and treatment evaluation; the mean agreement coefficients were above 80% for both participants.

Functional Analysis

A functional analysis based partly on procedures described by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994) and partly on a descriptive assessment was con-



ducted. Five 10-min sessions were conducted for each of five functional analysis conditions. A demand condition was not conducted because descriptive assessment data indicated that the target behavior did not occur during task demands. Instead, increased and decreased sensory conditions were conducted in which 15 s of sensory stimulation, such as television or music, was presented (or removed in the case of the decreased sensory condition) contingent on the occurrence of the target behavior. Additional details regarding functional analysis procedures are available from the authors upon request.

Treatment Evaluation

Sessions lasting 30 to 50 min were conducted each day. Stimulation in the form of background noise (e.g., carts being rolled down the halls, people conversing with each other) was present during all baseline and treatment sessions.

Baseline. Data on the target behavior were collected under conditions typical for the particular resident. No reinforcers were delivered, and nursing staff were asked not to interact with the resident. However, if a staff member needed to interact with the resident or if another resident interacted with the participant, the session was terminated until the staff member or the other resident left. Stimulation in the form of television or music was not available during baseline with HJ, although music was occasionally present during baseline and intervention sessions with TJ.

NCR. The reinforcers identified via the functional assessment were presented on a fixed-time (FT) schedule. The initial FT interval was determined by calculating the mean amount of time between the begin-

ning of each functional analysis session and the first occurrence of the target behavior during that session. For HJ, the reinforcer initially was presented continuously. This schedule was changed to FT 30 s when behavior reliably occurred below baseline levels. Because assessment data for HJ indicated that disruptive vocalization was functionally related to increased sensory stimulation or attention (or both), NCR with sensory stimulation (i.e., preferred music) initially was compared to NCR with both sensory stimulation and attention within a multielement design. For TJ, the initial schedule was FT 80 s. Sessions began with 10 s to 15 s of attention. The schedule was changed to FT 40 s when the target behavior occurred during more than 25% of the intervals for three consecutive sessions. Subsequent changes in the FT schedule were made when the target behavior was at or below 25% of intervals for three consecutive sessions.

RESULTS AND DISCUSSION

Functional Assessment

Selected test and control conditions from the functional analysis are presented in Figure 1 to highlight the potential functions of disruptive vocalization. The top panel shows that disruptive vocalizations occurred at somewhat higher levels in the attention condition relative to the control condition for HJ, suggesting that this response was partially reinforced by attention. Data in the middle panel show that disruptive vocalization may have been influenced by sensory reinforcement, because slightly higher levels occurred when this response resulted in increased stimulation relative to when it resulted in decreased stimulation. Results for

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Figure 1. Percentage of 15-s intervals with disruptive vocalization during HJ's (top and middle panels) and TJ's (bottom panel) experimental analyses.

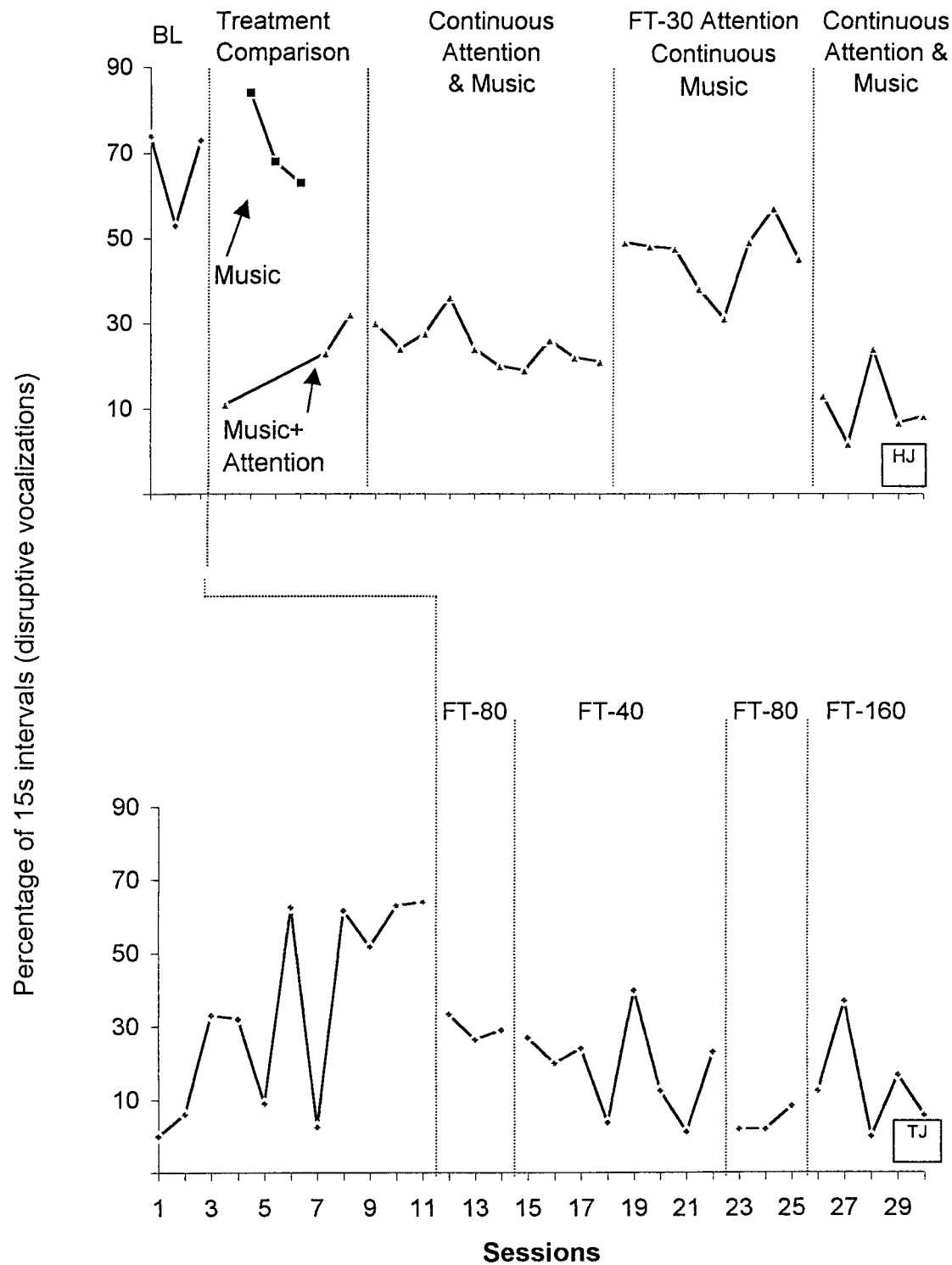


Figure 2. Percentage of 15-s intervals with disruptive vocalization across baseline and NCR treatment phases for HJ and TJ.

TJ are displayed in the bottom panel and suggest that his disruptive vocalizations were maintained by contingent attention, because consistently higher levels of the response occurred in the attention condition relative to when he was alone.

NCR Intervention

For HJ, the target behavior occurred during an average of 67% of intervals during baseline (see top panel of Figure 2). Greater decreases in disruptive vocalizations were observed when both music and attention were provided continuously, so this intervention was continued in the next phase. When the schedule of attention was switched to FT 30 s, the target behavior increased to baseline levels. Reductions were again observed when both music and attention were presented continuously in the final phase. For TJ, the target behavior occurred during an average of 35% of intervals during baseline (see bottom panel of Figure 2). During the initial FT-80 s phase, disruptive vocalizations did not decrease, so an FT 40-s schedule was instituted. Modest decreases in disruptive vocalizations then were observed, and the behavior remained low as the schedule was thinned to FT 160 s.

These findings support the utility of using functional assessment and NCR to treat disruptive vocalizations in dementia patients. One of the primary strengths of this study was that the assessment and intervention were performed in each participant's natural environment. In addition, treatment resulted

in increased access to reinforcers that were functionally related to the target behavior, which is important given that nursing homes can be relatively impoverished environments.

Although these results are promising, additional studies using more rigorous experimental designs and social validity measures are needed. Further research also is needed on strategies to produce less ambiguous experimental analysis outcomes with this population. The modest reduction in behavior under relatively rich NCR schedules is an additional limitation. It would be unreasonable to expect nursing home staff to maintain an FT 60-s schedule of attention. Examination of these complex issues of practicality is necessary if NCR is to be utilized with this population.

REFERENCES

- Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis*, 27, 197-209. (Reprinted from *Analysis and Intervention in Developmental Disabilities*, 2, 3-20, 1982)
- Ringdahl, J. E., Vollmer, T. R., Borrero, J. C., & Connell, J. E. (2001). Fixed-time schedule effects as a function of baseline reinforcement rate. *Journal of Applied Behavior Analysis*, 34, 1-15.
- Vollmer, T. R., Iwata, B. A., Zarcone, J. R., Smith, R. G., & Mazaleski, J. L. (1993). The role of attention in the treatment of attention maintained self-injurious behavior: Noncontingent reinforcement and differential reinforcement of other behavior. *Journal of Applied Behavior Analysis*, 26, 9-21.

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